

ERADICATION OF

WILD RADISH

(Kale or Jointed Charlock)

WILD TURNIP

WILD MUSTARD

BY SPRAYING WITH

SULPHATE OF IRON



White portion of picture shows Wild Mustard. Dark portion shows part of field sprayed with Sulphate of Iron, absolutely destroying the Mustard

American Steel & Wire Company

30 Church Street

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New York City

TO THE FARMER

IF your grain fields are infested with Wild Mustard, Wild Radish or Wild Turnip you cannot afford to overlook the information contained in this book. It is to your advantage to read thoroughly its entire contents.

ERADICATION OF WILD MUSTARD WILD RADISH (Kale or Jointed Charlock) WILD TURNIP BY SPRAYING WITH SULPHATE OF IRON

In New York State three species of the Mustard family are found. These are:

1. Wild Mustard.
2. Wild Radish.
3. Wild Turnip.

The most prevalent of these is the common Wild Mustard, with Wild Radish second, while the Wild Turnip occurs in such a limited quantity that as yet it can hardly be considered a serious pest.

The Mustard and Wild Radish, however, are very prevalent and are great drawbacks to grain farming in many sections of the State. A farmer cannot afford to let these weeds get a strong foothold on his land.

Inasmuch as during the early stages of growth it is rather difficult to distinguish between the three varieties, we will set forth the distinctions for the benefit of the farmers.

Both the Wild Mustard and Wild Radish have rough, hairy leaves, but the leaves of the Wild Radish are more deeply indented and feel thicker to the touch. The Wild Radish spreads rather flatly on the ground and finally throws up a single stalk, which later branches, whereas the Mustard tends to grow more upright and its leaves do not grow flat on the ground.

When the plants attain some size it will be found that the Wild Mustard has a straight, jointless seed pod which splits open when dry, like a capsule, and scatters its black, oily shot-like seed at the slightest touch. The Wild Radish, on the contrary, has a jointed seed pod, which tends to break cross-wise in segments when dry. On account of this tendency for the Wild Radish to break up into segments it is impossible for the farmers to remove it from their grain by sifting or fanning, and they therefore must procure clean seed oats or reseed their land with the oats containing Wild Radish.

The Wild Turnip may be distinguished by its smooth leaves, which grow in a clasping manner around the stalk. In many sections this Wild Turnip is called Mustard, but if any farmer who is in doubt will pull up the plant and smell of the root he will have no difficulty in deciding which is which. The Wild Turnip has the same odor as the common white variety, grown for table use.

1913 Campaign in New York

During the season of 1913 the American Steel & Wire Company carried on an extensive weed eradication campaign and the results were especially gratifying.

The work was confined to about twenty Counties in the State, taking in some one hundred sixty towns in the worst weed infested sections of these Counties, and the farmers are generally convinced of the value of Sulphate of Iron.

We have received testimonials from many farmers who have used Sulphate of Iron. Only a few appear in this book, but the list which follows shows those which we have on file. Look through the list and no doubt you will recognize the name of some farmer known to you. Copies of the original testimonials may be had on application.

LYONS, WAYNE Co., N. Y.

July 24th, 1913.

I have sprayed with Sulphate of Iron for two years, and it has given me satisfaction. My farm is full of mustard and I have been able to get rid of it each time I sprayed. I will continue to spray with Sulphate of Iron.

(Signed) FRED. ALBRECHT.

AURORA, CAYUGA Co., N. Y.

June 30th, 1913.

Two weeks ago I sprayed my 17 acres of barley with Sulphate of Iron for Wild Mustard. Yesterday your demonstrator, Mr. Hulbert, was here and he went over to the field to look at it. Where last year the mustard was so thick as to nearly ruin the crop, today there is but here and there a yellow flower showing above the grain, proof that it escaped the blighting touch of the spray. I am very much pleased with the results of the spraying.

Very truly yours,

(Signed) JAMES AVERY.

LITTLE YORK, CORTLAND Co., N. Y.

August 1st, 1913.

I used about 1750 lbs. Sulphate of Iron on about 17 acres. I am fully convinced it is a good investment and am satisfied with the results. I surely expect to use it another year. My oats were seeded with timothy clover and alfalfa and no injury was done to the seeding.

Yours truly,

(Signed) MAYNARD H. GATES.

AKRON, ERIE CO., N. Y.

July 25th, 1913.

I was thoroughly satisfied with the results obtained this year from the use of Sulphate of Iron to kill the mustard in my oats. Mustard has been a serious problem for me for years. I have used Sulphate of Copper for several years back, but this year tried Sulphate of Iron, using 1000 lbs. I am certain that Sulphate of Iron gives better results than Sulphate of Copper. For this reason I expect to use Sulphate of Iron next year. Furthermore, I am glad to recommend here the use of Sulphate of Iron to all farmers troubled with mustard.

Yours truly,

(Signed) HENRY WRIGHT.

SPRINGVILLE, ERIE CO., N. Y.

July 22d, 1913.

From my experience this year and last year I know Sulphate of Iron is all right. I used 400 lbs. of Sulphate of Iron on a field of oats located on low land in a creek flat. Here the mustard grows rank and thick. The mustard was practically all killed without injuring the oats at all.

I am pleased to recommend Sulphate of Iron to any and all farmers who have mustard. I am certain that the killing of mustard in grain will increase the yield to quite a large degree. Besides it is a pleasure to all good farmers to grow clean grain.

Yours truly,

(Signed) PETER SALZIER.

BYRON, GENESSEE CO., N. Y.

August 4th, 1913.

I am satisfied that Sulphate of Iron will kill Wild Mustard. I used it last year with very good results.

Yours truly,

(Signed) J. A. COLE.

BYRON, GENESSEE CO., N. Y.

August 4th, 1913.

I sprayed three acres of Barley to kill wild mustard. It killed the mustard completely without injury to the barley. I have not raised spring grain on account of the mustard. Next year I will sow eleven acres and expect to spray.

Yours truly,

(Signed) E. H. CHAPPELL.

HOMER, CORTLAND CO., N. Y.

July 22d, 1913.

For the past few years I have been using Blue Vitriol in trying to control the wild mustard which has overrun my farm. While this material does fairly good work, it is too risky to use, as it must be sprayed in such a strong solution that it is poisonous to animals that may eat the grain and straw. I therefore used Sulphate of Iron this year, as it is not poisonous and certainly does the business. It cleaned out the mustard in fine shape and did not set back the oats any more than would a spell of dry weather.

Yours truly,

(Signed) D. H. BINGHAM.

ADAMS CENTER, JEFFERSON CO., N. Y.

July 11th, 1913.

I had nine acres of oats this year in which the mustard came up very thick. Just before the plants were in blossom I sprayed with Sulphate of Iron, using 1,000 lbs. The material was applied with an ordinary hand force pump and 50-gallon barrel. I am satisfied with the results, as nearly all the mustard was killed with no harm to the grain and new seeding. Now my oats look greener than ever and are growing well. I shall use Sulphate of Iron next year if I have mustard, and would strongly advise other farmers to do the same who are troubled with this pest. It will mean a good many dollars per acre to me to have the mustard eradicated, and I know Sulphate of Iron will do it.

Yours truly,

(Signed) C. K. COLTON.

CARTHAGE, JEFFERSON CO., N. Y.

July 17th, 1913.

This year the mustard came up in my oats about as thick as it could grow. I expected the usual loss in yield as well as big harvest of mustard seed in my oats, but hearing so much of the good work done in this county with Sulphate of Iron I resolved to try it.

I sprayed twenty-five acres of oats, using over one and one-half tons of Sulphate of Iron with excellent results. The great mass of mustard was killed without injuring either the grain or new seeding. Now I have a clean field of grain that is looking fine.

I want to rid my farm of mustard and believe that I can do it by properly applying Sulphate of Iron. I consider this a relatively cheap method of eradication. I am glad to recommend it to all farmers whose corn and grain is yellow with mustard at harvest time.

Yours truly,

(Signed) W. D. BALL.

EVANS MILLS, JEFFERSON CO., N. Y.

July 11th, 1913.

I have seven acres of corn planted on Creeks Flats which overflow in the wet season and from this cause we assign the rank growth of wild mustard and kale. This piece of corn was sprayed with Sulphate of Iron July 2d and within forty-eight hours every mustard plant was killed. The corn is now doing fine. I shall not have the expense of hiring fifteen or twenty boys to go in and pull the mustard as heretofore. I firmly believe that Sulphate of Iron is going to be as great a benefit to the farmers as the spraying process is to the fruit growers.

Very respectfully,

(Signed) FRANK W. LAWTON.

MANLIUS, ONONDAGA CO., N. Y.

July 30th, 1913.

I used 2000 lbs. of Sulphate of Iron on 20 acres of oats where the mustard was four times as thick as the oats, and this plot had been seeded to alfalfa and timothy. The mustard was a little too far along when the spraying was done. Another year I shall spray when the mustard is in the third or fourth leaf. It killed 90% of the mustard and so weakened the balance that it looked sick, with no injury to the oats or seeding.

Very truly,

(Signed) H. A. ADAMS.

WATERTOWN, JEFFERSON Co., N. Y.

July 15th, 1913.

For years Wild Mustard has been one of the most serious problems I have had to contend with. I firmly believe that a remedy has at last been found in the shape of Sulphate of Iron. I sprayed six acres of oats with Sulphate of Iron, practically killing the mustard without injuring the grain.

We have much mustard in this locality which each year damages to a more or less degree the grain. It seems to me that we need a concerted effort on the part of farmers to eradicate mustard. Sulphate of Iron, if properly applied with a good pump, will do the work. I am pleased to recommend it to all farmers who desire to rid their farms of mustard.

Yours truly,

(Signed) F. J. LASHER, Mgr.,
The S. R. Cleveland Farm.

BOUCKVILLE, MADISON Co., N. Y.

July 18th, 1913.

I had a piece of oats that was so full of mustard that you could hardly find the oats. A neighbor came in and sprayed it with Sulphate of Iron and practically saved that crop of oats. Afterwards I sprayed about 7 acres of corn in which the mustard was bigger than the corn. It certainly put a check on that mustard and did hardly any damage to the corn, which is now looking fine. I also sprayed a few rows of peas in which the peas and mustard were a foot high. It blackened the pea leaves a little but it blackened the mustard so that it stopped growing. The peas gave just as good a crop as if the mustard had not been there. Altogether I think that any farmer who is bothered with mustard will find this to be the most thorough and practical way of getting rid of it.

Yours truly,

(Signed) GEO. LALLMAN.

SAVANNAH, WAYNE Co., N. Y.

June 28th, 1913.

I have used your Sulphate of Iron as a spray on mustard and am very much pleased with results. It seems as though we had found a solution of the mustard question and shall continue to spray from this on, sure that it pays in the increase of grain and in the eradication of mustard.

Yours truly,

(Signed) EDWARD BOWLER.

WARSAW, WYOMING Co., N. Y.

July 18th, 1913.

Through the center of my 25 acre field of oats the mustard came up this Spring very thick. I used 1200 lbs. of Sulphate of Iron, covering about 12 acres of this field where the mustard was the thickest. Though I sprayed very late, when the mustard was in full bloom, and had started to go to seed, the Sulphate of Iron killed the mustard completely.

Next year I shall certainly use Sulphate of Iron. I am fitting over a pump now to use next year so that I may be ready to spray when mustard plants are younger and oats are not so large. The time to prepare pump, boom, etc., is in the winter, then everything will be ready when it is time to spray.

Yours truly,

(Signed) E. B. EVENINGHAM.

We also have testimonials on file from the following:

<i>Name</i>	<i>Town</i>	<i>County</i>
Wm. Marshall	Aurora	Cayuga
James H. Chase	"	"
John Hall	Moravia	"
Miss Emily Howland	Sherwood	"
L. S. Shattuck	Norwich	Chenango
Henry Lathrop & Sons	Sherburne	"
L. E. Purdy	"	"
Irving E. Clark	Preble	Cortland
A. A. Knapp	"	"
Harry Clark	"	"
John D. Yocum	Akron	Erie
P. G. Gerkin	Hamburg	"
J. C. Well's Son	Town Line	"
Dennis J. Phelps	Corfu	Genessee
F. D. Ross	"	"
Thos. J. Heddon	LeRoy	"
W. G. Coverdale	"	"
T. C. Edson	"	"
John R. Stevens	"	"
Callam & Gillmore	Oakfield	"
L. O. Center	West Winfield	Herkimer
H. S. Patrick	Adams	Jefferson
S. M. Jones	"	"
A. G. Chamberlain	"	"
Fred E. Peacock	Antwerp	"
A. W. Whiteford	"	"
Lewis L. Lee	Dexter	"
James Gardner	Watertown	"
Chas. B. Clark	Deer River	Lewis
M. Wiard	Avon	Livingston
W. O. Moore	Cuylerville	"
Uriel B. Moses	Lima	"
C. H. Murray	Linwood	"
J. W. Jones & Son	Nunda	"
Ernest F. Dahn	Bouckville	Madison
Geo. W. Davis	"	"
Lewis & Stowell	"	"
J. W. Coley	New Woodstock	"
Peter O'Toole	Solsville	"
F. W. Marshall	Stockbridge	"
W. E. James	Charlotte	Monroe
D. Brooks	Chili	"
A. D. Cosman	Hilton	"
C. A. Kanons	"	"
Henry F. Schultze	Charlotte	"
Jas. H. Boughton	Spencerport	"
Wm. Statt	"	"
Henry Grundman	Webster	"
J. C. Peet & Son	"	"
J. N. Evans	Ransomville	Niagara
John M. McAuly	Lockport	"
R. A. Ryan	Apulia Sta.	Onondaga
F. Munns & Son	Jordan	"
H. W. Scammell	LaFayette	"
F. D. Kershaw	Manlius	"

<i>Name</i>	<i>Town</i>	<i>County</i>
Dr. H. G. Padget	Tully	Onondaga
F. P. Warner	Canandaigua	Ontario
Thos. Magary	"	"
D. P. McMullen	Clifton Springs	"
D. D. Allcott	Naples	"
Levi R. Page	Seneca Castle	"
Floyd Austin	Medina	Orleans
A. M. Ives	Waterport	"
P. B. Wilson	"	"
T. W. Babcock	Oswego R.D. No. 2	Oswego
D. C. McKeel	Interlaken	Seneca
L. B. Buck	Waterloo	"
Herbert Sigsby	Walworth	Wayne
Geo. J. Frowley	"	"
Daniel Van Lare	Williamson	"

The fact that we have received so many letters from the farmers who have used Sulphate of Iron shows you how well they were pleased with this method of weed eradication.

The farmers who have weed infested grain fields will be glad to learn that it is no longer necessary to pull the weeds by hand, but that they may be killed by spraying with an ordinary machine, such as is used for spraying potatoes, provided it is fitted for weed eradication by the addition of a boom suitable for broadcast spraying.

If a farmer will carefully carry out the instructions which follow he will have no difficulty in clearing his grain fields of weeds and producing good, clean seed grain.

General Instructions for Spraying Sulphate of Iron

The Sulphate of Iron should be mixed in a vinegar, kerosene or oil barrel holding about 52 gallons. Thoroughly scrub and clean the barrel before using.

Fill the barrel half full of water and dump in this 100 pounds Sulphate of Iron. Stir sufficiently to dissolve Sulphate.

When ready to place the solution in the tank of the spraying machine, be sure to strain it through two thicknesses of cheese cloth. A simple method is to simply tack the cheese cloth across the manhole of the machine, but a better strainer can be made by sewing it around a small hoop. This straining will remove any coarse dirt which may be in the solution and will greatly lessen the clogging troubles in the field while spraying.

This mixture will give a 20 per cent solution, which is the proper strength for spraying, and under ordinary circumstances 52 gallons is sufficient to spray one acre. If, however, you find that your machine puts on more than 52 gallons of

the spray solution per acre, add enough water when filling to insure getting over the acre, but be sure that the whole 100 pounds of Sulphate per acre is applied.

Other methods can be adopted for mixing the solution, but the same general outline should be followed.

Time to Spray

Wild Mustard should not be sprayed when the plant is in the bud. At this time the plant is stronger than at any time during the growth and for this reason is more resistant to the effect of Sulphate of Iron. *Mustard* should be sprayed either before or after budding.

Wild Radish cannot be successfully treated with Sulphate of Iron when it has more than four leaves. At this time the plant will not spread over three to four inches, and being young and tender can be easily killed.

Wild Turnip should be sprayed when the plant has from four to six leaves. In other words, it is possible to kill it at a slightly more advanced stage than the Wild Radish.

If your grain field has a mixture of any two or all three of these weeds, spray as soon as any one of the weeds is ready. For instance: If you have Wild Radish and Wild Turnip in the same field, the Wild Radish will be ready to spray earlier than the Wild Turnip, for the Wild Radish must be sprayed at a younger stage.

Weather Conditions

A cloudy day is preferable to a clear, hot day.

Do not spray if rain is expected within eighteen hours.

Do not spray until the dew is off the plant. Avoid spraying when there is a heavy wind, for it will blow away the mist, which is the most effective part of the spray.

If possible, spray when there is a probability of a heavy dew following the spraying.

Rate of Application Per Acre

The Sulphate of Iron should be applied at the rate of 100 pounds per acre and under ordinary conditions this amount should be sufficient to kill the three types of weeds. However, if it rains in less than eighteen hours after spraying, the Sulphate will be washed off the plants before it has had chance to do its work, and thus a second spraying will be necessary.

We have also found that if Wild Radish, which is the most hardy of the three weeds, is too large when sprayed, it will possess enough vitality to withstand the effect of the Sulphate, and a second spraying about a week after the first will be necessary.

Cleaning Machine

After spraying it is a good plan to wash out the machine by pumping clean water through it, and in this way the rusting may be prevented.

Machines, Booms and Nozzles

Practically any type of spraying machine can be used, either power, traction or even a good hand pump placed in an ordinary farm wagon, providing a suitable boom is used in connection with same. While a hand pump will answer the purpose on areas up to five or six acres, we strongly recommend that traction sprayers should be used wherever possible.

Use a double action pump in order to give a more uniform and uninterrupted spray. At all times the pump should maintain a pressure of approximately 80 to 100 pounds in order to produce a fine, misty spray, which is absolutely necessary for weed killing. Rotary sprayers with a gravity feed and whirling fans cannot be used if there is any wind, for the spray has so little force that it will blow very badly.

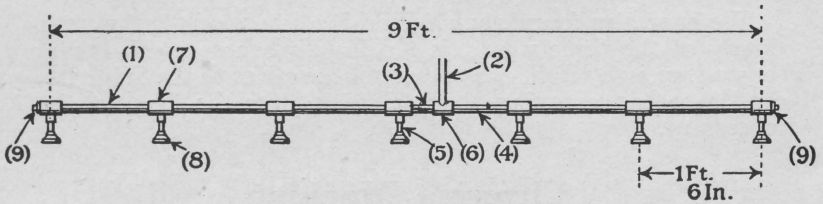
A four-nozzle potato boom will not thoroughly cover the ground, but with no wind a four-row, eight-nozzle boom will do fair work. To obtain the best results the potato boom should be altered as follows:

Converting Potato Boom

Cut the pipe midway between nozzles and join the lengths with tees, to which the extra nozzles may be attached. With this arrangement it is simply necessary to plug up the extra nozzles to spray potatoes.

Home Made Spray Boom

If you do not wish to use your potato boom for weed spraying, the following are the specifications for a boom, which you can readily make or have made in a local shop. This boom can be used with any machine, whether power, traction or hand pump.



Bill of Material

Pieces	Size	Kind
(1) Five	$\frac{1}{2}$ " x $16\frac{1}{2}$ "	Galvanized Nipples
(2) One	$\frac{1}{2}$ " x 4"	Galvanized Nipple
(3) One	$\frac{1}{2}$ "	Close Galvanized Nipple
(4) One	$\frac{1}{2}$ " x $14\frac{1}{2}$ "	Galvanized Nipple
(5) Seven	$\frac{1}{4}$ " x $2\frac{1}{2}$ "	Brass Nipples
(6) One	$\frac{1}{2}$ " x $\frac{1}{2}$ "	Galvanized Tee
(7) Seven	$\frac{1}{2}$ " x $\frac{1}{4}$ "	Galvanized Tees
(8) Seven		Nozzles
(9) Two	$\frac{1}{2}$ "	Plugs

Use a nozzle which will give a fine, misty spray at about 80 to 100 pounds pressure. We recommend a nozzle having some sort of a strainer, such as the "New Strainer Tiger," made by the Field Force Pump Co., Elmira, N. Y., or the "E. C. Brown" Nozzle, made by the E. C. Brown Sprayer Co., Rochester, N. Y. This type of nozzle practically stops all clogging during spraying, and in this way saves so much time in the field that it is worth all the extra cost.

Use of Sulphate of Iron in Different Crops

Sulphate of Iron may be used without injury on the following crops: Oats, barley, rye, millet, wheat and corn. Some farmers have also reported that fields of oats and peas mixed were sprayed without any injurious effect. In corn the Sulphate of Iron will reach the mustard plants in the row growing close to the stalks, which would not be reached by knives of the cultivators. The leaves of the corn, particularly the point of the leaf, will be darkened by the solution, but the plant quickly recovers.

The leaf of the potato is so similar to that of the Wild Radish and Mustard that Sulphate of Iron cannot be used in this crop.

Effects After Spraying

For three or four days after any crop is sprayed it will appear brown and blackened, due to the burning effect of the Sulphate. Timothy and clover will also have this appearance and many farmers have feared that their seeding was permanently injured. However, this effect on timothy and clover seeding and on growing crops is only temporary and no farmer should feel alarmed, for the black color will disappear in from three to five days and the sprayed crops will again be green and thrifty, whereas the weeds will be totally killed out.

Practically no grain is injured by driving the machine through the fields, and two or three weeks after spraying it is next to impossible to see the marks made by the wheels or horses' hoofs. While the wheels roll down a small amount of the grain, we have found that practically all will fully recover within a few days.

Cautions in Regard to Spraying

1. Mix the solution thoroughly and strain before spraying.
2. Use a traction machine wherever possible.
3. Use a boom with the nozzles about 18 inches apart, so that the ground will be thoroughly covered.
4. Have the boom high enough so that all the plants will be thoroughly covered.
5. If possible, use a nozzle having a strainer and be sure to have sufficient pressure to get a fine, misty spray. This can be accomplished with a pressure of from 80 to 100 lbs.
6. Spray when no rain is expected for at least 18 hours and when there is no heavy wind.
7. Spray when there is a probability of a heavy dew after the application.
8. *Do not spray* Mustard when it is in the bud. *Spray* either before budding or just after it comes into blossom, before podding.
9. Spray Wild Radish when it has no more than four leaves.
10. If necessary spray twice, making the applications about one week apart.
11. See that the nozzles work properly and do not clog.
12. Clean the machine after spraying and oil the working parts.

Bureau of Information

If you desire information which is not given in this booklet, do not hesitate to write us, for we have a well equipped department to answer inquiries, and we will cheerfully and to the best of our ability answer any questions you may desire to submit.

Final

The success or failure in spraying grain crops to kill Wild Mustard, Wild Radish and Wild Turnip depends on how and when the Sulphate of Iron is applied. It is better to spray too early than too late, so don't delay.

We will arrange so that a large supply of Sulphate is carried in the different localities, so that every farmer may obtain a sufficient amount for his needs, and if he will but follow the instructions in this booklet, there is no farmer who cannot absolutely rid his grain fields of the weed pests: Wild Mustard, Wild Radish and Wild Turnip.

Remember that Mustard grows very rapidly, and the delay of two or three days may be dangerous. Therefore, arrange to secure your supply of Sulphate of Iron early, so that there will be no delay when the time for spraying arrives.

